On Demand

Atomic Layer Etching
Room On Demand - Session ALE1

Plasma and/or Energy-enhanced ALE

ALE1-1 Interpretation of SiO_2 Atomic Layer Etching Based on Plasma Diagnostics, ***Youngseok Lee***, *C. Cho,* Chungnam National University, Korea (Republic of)*; S. Kim,* Nanotech, Korea (Republic of)*; J. Lee, I. Seong, S. You,* Chungnam National University, Korea (Republic of)

Atomic-scale etching in semiconductor processing requires self-limiting behaviors to obtain highly precise controllability of material thickness. Achieving the self-limiting behaviors during atomic layer etching (ALE) is dominantly determined by the processing plasma parameters such as electron density and ion energy distribution, which governs the processing conditions. Knowing such fundamental parameters of the processing plasma is therefore essential in realizing ideal ALE. We analyzed our ALE data obtained by an in situ ellipsometer based on plasma diagnostics using an emissive probe and quadrupole mass spectrometer. What we focused on among various plasma parameters is plasma potential and radical density since they are directly related to ion bombarding energy and chemical reaction during the ALE process, respectively. The analysis explained how the ALE results changed according to processing condition variations. In this presentation, the validity of our plasma diagnostics and the analysis results will be discussed in detail.

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